1. Stanford Research Institute, *Energy Consumption in the U.S.* (Menlo Park, Calif., November 197[illegible], prepared for the Office of Science and Technology, Washington, D.C., January 1972), p. 6.
2. American Society of Heating, Refrigerating and Air-Conditioning Engineers, *Handbook of Fundamentals* (New York, 1972), p. 367.
3. Quantities expressed as British thermal units per thousand cubic feet—degree day represent the heating requirements of a building relative to its size and the severity of the climate in which it serves. Conversion factors are: from British thermal units to joules, 1055; cubic feet to cubic meters, $2.83 \times 10^{-2}$.
4. J. C. Moyers, *The Value of Thermal Insulation in Residential Construction: Economics and Conservation of Energy* (Oak Ridge National Laboratory, Report ORNL-NSF-EP-9, Oak Ridge, Tenn., December 1971), p. 28.
5. American Society of Heating, Refrigeration, and Air-Conditioning, *Engineers Handbook of Fundamentals* (New York, 1972), pp. 381-383.
6. ———, *ibid.*, p. 421; National Association of Home Builders Research Foundation, *Insulation Manual* (Rockville, Md., 1971).
7. H. C. Hottel and T. B. Howard, *New Energy Technology—Some Facts and Assessments* (M.I.T. Press, Cambridge, Mass., 1971).
8. Even in large power plants much heat is lost. In a typical modern power plant approximately two-thirds of the heating value of the fuel consumed must be rejected to the atmosphere. This reject heat is not [illegible] of this heat is required by the second law of [illegible] a consumer, much of this heat could be put to use in waste processing, water purification, [illegible] air conditioning for example, [illegible].
9. U.S. Department of Commerce, *The Energy Crisis: An Analysis* (Washington, D.C., April 1972).
10. P. K. Sheffield and L. J. Lazaridis, *Nat. Gas Pet. Technol.*, in press.
11. G. A. Meier, "Practical Means of Conserving Energy Today in the Residential, Commercial and Industrial Market" (University of Pittsburgh School of Engineering Library, Pittsburgh, 1971); D. P. Gregory, *A Techno-*[illegible] *Use of Energy* [illegible], Chicago, 1971); [illegible] *The Future of Industrial* [illegible] Gas Technology, Chicago,
12. [illegible] Nesbitt, *Improving the Utilization of* [illegible] *Gas in Major Steel Mill Applications* [illegible] of Gas Technology, Chicago, 1972).
13. It is not intended to imply here that quality [illegible] is not considered in acquisition of industrial equipment, but rather that of two devices which yield the same product, the cheaper will tend to be preferred, irrespective of energy consumption. Those industrial accounting systems in which energy requirements are carried as overhead appear to reinforce this tendency.
14. U.S. Department of Housing and Urban Development, International Brief, January 1971.
15. National Mineral World Insulation Association, Impact of Improved Thermal Performance in Conserving Energy (National Bureau of Standards, Washington, D.C., April 1972), p. 35.
16. A topping cycle is an additional power generation plant which receives heat at the temperature of combustion, and rejects heat at the maximum temperature required by the main power plant. The topping cycle utilizes the temperature drop between the combustion chamber and the boiler of the plant, to generate power.
17. In nighttime power generation, it would be possible to reject heat at subatmospheric temperatures, through radiative techniques, and thus avert local thermal overloading of [illegible].
18. P. R. Achenbach, J. B. Cobb, B. C. Cadoff, T. Kasuda, *A Feasibility Study of Total Energy Systems for Urban Low-Rise Housing Sites* (National Bureau of Standards Report 10 402, Washington, D.C., August 1971), [illegible].
19. K. Cobi, Institute for Energy Conversion, University of Delaware, personal communication.
20. Few small units can justify spending more than 3 cents per kilowatt hour for maintenance; few can be maintained for less.
21. H. Buchberg, O. A. Lafunde, D. K. Edwards, *Solar Energy J. Solar Energy Sci. Eng.* 13, 193 (1972).
22. H. C. Hottel and A. Whillier, "Evaluation of [illegible] performance," in *International Conference on the Uses of Solar Energy Proceedings* (University of Arizona Press, Tucson, 1958); H. Tabor, *Bull. Res. Counc. Israel* 5C, No. 1 (1955).
23. Committee report, *Solar Cells, Outlook for Improved Efficiency* (National Academy of Sciences, Washington, D.C., 1972), p. 3.
24. A. Whillier, "Solar house heating—a panel," in *International Conference on Uses of Solar Energy* (Univ. of Arizona Press, Tucson, 1958).
25. R. A. Tybout and G. O. G. Löf, *Nat. Resour. J.* 10, 268 (1970).
26. In this comparison it is assumed that the consumer will own and maintain the solar device, but such an arrangement may be neither necessary nor desirable.
27. H. C. Hottel, "Residential uses of solar energy," in *International Conference on Uses of Solar Energy* (Univ. of Arizona Press, Tucson, 1958); G. Pheijel and B. Lindström, *New Sources of Energy, United Nations Conference, Rome, 21 to 31 August 1961*, p. 207-223.
28. D. N. W. Chinnery, *CSIR (S. Afr. Counc. Sci. Ind. Res.) Res. Rep. No. 248*, pp. 1-79 (1967).
29. S. J. Richards and D. N. W. Chinnery, *ibid., No. 237*, pp. 1-26 (1967).
30. The average cited here was obtained over a period during which cloudy and sunny weather obtained.
31. For example, in certain industrial areas local efforts to decrease air pollution started with conversion of both industrial domestic combustion equipment from coal and oil to gas. It would be difficult to justify [illegible] at this point. The same argument applies to domestic heating equipment.
32. Such a plant will also be able to supply a large quantity of residual fuel oil to those installations capable of using it. However, for the purposes of estimating the costs of supplying energy for domestic consumption, I compare the cost of the plant to its capacity to supply gas, which is its principal function.
33. The thermodynamic notion of quality (or more precisely, availability) is a measure of the extent to which the form of energy can be converted to work.
34. "Refuse-fueled power station," *Technol. Rev.* May 1972, p. 62.


NEWS AND COMMENT

# Psychical Research: The Incredible in Search of Credibility

Bill Delmore is a dropout from the Yale law school, but he has a grant from Harvard to explore the nature of his psychic abilities. From an early age, he says, he has had a facility for guessing cards. Friends arranged for him to give a demonstration of card-guessing before the Harvard psychology faculty, which controls a small fund earmarked for research on psychic phenomena. At the Foundation for Research on the Nature of Man, in Durham, North Carolina, Delmore's card-guessing powers are being analyzed by J. B. Kelly, who switched to psychical research last year after getting a Ph.D. from Harvard in psycholinguistics. An assistant holds up playing cards enclosed in black envelopes, while Delmore guesses at them, sometimes one by one, sometimes for several cards in advance. With certain guesses he is particularly confident of being correct, and says so before the card is taken from its envelope. In an experiment recently reported by Kelly to the Harvard psychology faculty, Delmore made 20 such "confidence calls," 14 of which were correct. Asked how he makes the guesses, Delmore says by luck. How does one make a lucky guess? "By forming a visual image and then rationalizing it. Like having an image of seeing a butterfly, and then seeing the butterfly."

Parapsychology—the scientific study of telepathy, clairvoyance, and other manifestations of the inexplicable—is undergoing a minirenaissance, although without any assurance that the rebirth will be recognized as legitimate by the arbiters of scientific orthodoxy. The card-guessing experiments at Durham illustrate both the hope and despair of the parapsychologists' predicament. Young scientists are still prepared to risk their good name and fortune to work in the field, yet even when results are produced by experimental designs that would be accepted without demur in an ordinary science, the mainstream scientific community refuses to be impressed or even very interested. Rigor-

ous proof is one thing, proof of the apparently absurd another.

Despite unrelenting discouragement from their more orthodox colleagues, and a lack of any very remarkable breakthrough in their own field, the parapsychologists have nonetheless persevered. There are about a score of full-time researchers in the country, and many others who are involved part time or intermittently. The Parapsychological Association boasts more than 100 full members in this country and abroad, almost all of whom hold a Ph.D. or master's degree in a scientific subject. To talk with, parapsychologists are serious and sober men, not obviously different from other scientists except that their belief in extrasensory perception (ESP) places them beyond the pale of ordinary scientific discourse.

Maybe a little too hopefully, parapsychologists believe that cracks are beginning to appear in the scientific community's monumental indifference. Parapsychology itself has taken a new tack in recent years, breaking out of the traditional card-guessing, statistic-gathering exercise into more adventurous and provocative fields, such as the study of ESP in animals and during altered states of consciousness. In the outside world, the *zeitgeist*, as parapsychologists like to refer to it, has moved in their favor. The values of the counterculture have rendered outright hostility to parapsychology less fashionable. After many rebuffs, the parapsychology association was recently admitted into the ranks of the AAAS. The National Institute of Mental Health has recently awarded two grants for parapsychological research. Some 75 educational institutions throughout the country offer courses on parapsychology, many of which are for credit. And a larger public became aware of the scientific pursuit of ESP when lunar module pilot Captain Edgar D. Mitchell performed a card-guessing experiment during the voyage of Apollo 14.

There is a wide variety of approaches among the several parapsychological research groups. Since leaving NASA, Mitchell, for example, has set up the Institute of Noetic Sciences, to further studies of human consciousness, including the faculty for ESP. Mitchell started reading the parapsychological journals and the works of people such as J. B. Rhine, one of the founders of modern parapsychology, and, he says, " found much to my surprise that the more I read, the more my skepticism receded away. Experiments of my own, culminating in the one on Apollo 14, so fascinated me that I launched into it as a full-time study."

With a staff of nine, Mitchell's institute is engaged in educational activities and in raising funds from public and private sources for research in ESP. Some 25 deserving projects have been lined up. Mitchell himself is editing a book, *Psychical Research—A Challenge to Science*. Younger physicists, he believes, are becoming interested in ESP because of a prevailing disillusionment with establishment paradigms. Study of psychic phenomena is now moving into a new phase of investigation, which, Mitchell opines, "has probably brought us to the verge of expanding our knowledge of science as dramatically as Einstein did."

Mitchell's institute, founded this March, is the newest venture in parapsychology. The best known, to which the Post Office delivers mail addressed "ESP, USA," is the Foundation for Research on the Nature of Man (FRNM). J. B. Rhine, the grand old man of parapsychology, set up the foundation a few years before retiring from the parapsychology laboratory at Duke University, Durham, in 1962. While at Duke, Rhine and his associates initiated the card-guessing experiments which have formed the dominant trend in psychical research until the last few years. The heyday of Rhine's career was in the 1930's when he established, by methodology his critics eventually ceased to dispute, statistical evidence in favor of what psychic phenomena? Clairvoyance (the extrasensory perception of events, for example, mind-reading), precognition (awareness of events before their actual occurrence), and psychokinesis (the influence of physical events by mental powers, such as determining the fall of a dice) are all phenomena that Rhine believes to be experimentally established.

### Not What It Not Expected

Though said to have been a fighter in his younger days, he is now philosophical about what he considers the short shrift his subject has received at the hands of the orthodox scientific community. "Our ideas have not received fair treatment, but I never expected them to, so I am not upset," Rhine remarks. "We have kept busy, we've been treated better than we thought we would be."

Rhine is no longer active in research, but his foundation supports three full-time scientists. Helmut Schmidt, a quantum physicist who used to work for Boeing, is interested in the ability of psychic subjects to predict (or influence) the behavior of a random number generator. Walter J. Levy, a psychologist, has studied ESP in animals, and B. K. Kanthamani, also a psychologist, has worked on the personality characteristics of gifted ESP subjects. Rhine, although his work remains mostly unacknowledged except by the converted, is beginning to receive recognition at least as an important figure in the history and social relations of 20th-century science. A historian of science, Seymour Mauskopf, and a sociologist, Barry Poss, both of Duke University, are studying, respectively, the early history of Rhine's investigations and the effect on his group of being regarded as outsiders by the scientific community..

Rhine's is not the only group of ESP researchers boasted by the otherwise unremarkable town of Durham. The Psychical Research Foundation (PRF) split off from the Rhine fold in 1960 in order to pursue the question of survival after death—an issue Rhine does not consider amenable to scientific study. The PRF supports a single full-time researcher, W. G. Roll, who has carried out several investigations of poltergeists. Robert L. Morris, a psychologist who works part time at the foundation, has carried out studies of psychical faculties in animals.

The South is also home to the largest group of psychical researchers in the country, the Division of Parapsychology at the University of Virginia, Charlottesville. Head of the division is Ian Stevenson, a psychiatrist who has traveled around the world gathering case histories suggestive of reincarnation. Other members of the division include J. Gaither Pratt, a long-time colleague of Rhine's at Duke, and Rex Stanford, a psychologist who studies ESP in altered states of consciousness, such as when the brain is in the relaxed state associated with production of alpha waves. Also at Virginia is Robert L. Van de Castle, director of the dream laboratory, who has investigated ESP among primitive peoples such as the Cuna Indians of Panama.

The oldest psychical research establishment in the country is the American Society for Psychical Research (ASPR) in New York City. Quartered in an elegant townhouse next to Central Park, the ASPR's mandate is the sci-

by birth, is the society's director of research. Recently he sent two subjects on a round-the-world air trip in order to explore the effect of distance on ESP. Another project is the investiga- [illegible] of activity independent of the body.

Old school parapsychologists like Rhine doubt the value of studying the more esoteric aspects of the occult, [illegible] poltergeists, reincarnation experiences. A new kind of psychical experiment that is somewhat more amenable to scientific study is the investigation of ESP during sleep, particularly the periods of dreaming marked

# Briefing

## Energy Policy, Phase II

In an encore to his April energy message, President Nixon, on 29 June, let out the long-awaited details of his proposal to reshuffle the federal energy establishment.

For good measure, he also suggested some ways the public and the government could reduce energy consumption (turn down thermostats 4 degrees, travel less, and slower) and he went half-way toward meeting Democratic Senator Henry Jackson's call for a new Manhattan Project-sized program of energy [illegible] over the next 10 years. Nixon is [illegible] a $10 billion, 5-year effort; [illegible] is pledged to budget an extra $100 million, bringing the total proposed for the year to about $[illegible] million.

The proposed reorganization, described by the White House as a revised and improved version of one that died in the last session of Congress, generally follows predicted lines (*Science*, 29 June). But in one novel twist, the White House appears to have reinvented in form, if not in substance, the recently dismantled Office of Science and Technology and the President's Science Advisory Committee. The names have changed, and their missions are narrower; but the functions of a new presidential Energy Policy Office and its R & D advisory committee (whose members are yet to be appointed) seem much the same.

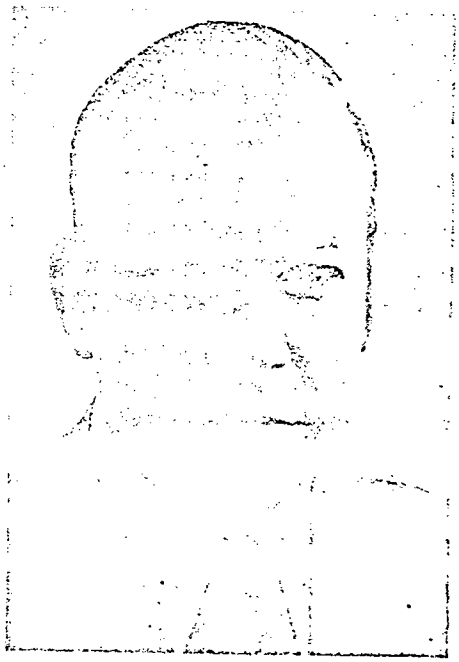
Four new entities emerged from the message, the latter three of which must be approved by Congress and are certain to provoke some jurisdictional scrambling:

- The Energy Policy Office and its advisory committee replace a 6-month-old policy triumvirate of Henry Kissinger, George Shultz, and the Watergated John Ehrlichman. A small staff assembled under White House energy counselor Charles DiBona will be expanded. The President named John Love, the Republican governor of Colorado, as director of the new office.
- A Department of Energy and Natural Resources (DENR) combines the existing Interior Department (minus its coal and other energy R & D programs) with the Forest Service and parts of the Soil Conservation Service (both now in the Agriculture Department), with "planning and funding" elements of the Army Corps of Engineers, and with the interagency Water Resources Council. The National Oceanic and Atmospheric Administration would be removed from the Commerce Department and linked with the Geological Survey in the DENR.
- An Energy Research and Development Administration would be composed of the R & D side of the Atomic Energy Commission staff, minus the AEC's regulatory functions, plus $100 million worth of R & D from the Interior Department.
- A Nuclear Energy Commission would be made up of the licensing and regulatory side of the Atomic Energy Commission (which would, on paper, cease to exist) and would be headed by a five-member commission.

Dixy Lee Ray is rumored to be a leading contender to head the new R & D agency and Interior Secretary Rogers C. B. Morton is widely mentioned as a candidate for Secretary of the DENR.—R.G.

## OST Is Dead Long Live STPO

The fall and decline of the Office of Science and Technology (OST) ended officially on 30 June with the transfer of many of OST's functions to the National Science Foundation (NSF). The surprise announcement of the Administration's decision to abolish OST came early this year (*Science*, 2 February), but the office has continued to operate during a transition period. In recent months, however, OST has been perceptibly fading away, with a few staff members taking up duties in the successor unit in NSF and others retiring



Russell C. Drew

from federal service of taking other jobs inside or outside government.

Information on what was to replace OST has been lacking, but on 2 July NSF Director H. Guyford Stever, who is responsible under the reorganization for advising the President on science and technology questions, unveiled his basic plan. Stever announced formation of a Science and Technology Policy Office (STPO) in NSF and the appointment of Russell C. Drew, a physicist with government experience, to head the new office.

Drew served on the OST staff from 1966 to 1972 and currently heads the Office of Naval Research branch office in London. At OST Drew dealt with a range of problems including air traffic control, space science and technology, biomedical R & D related to aerospace activities, and telecommunications.

Drew did his undergraduate work at the University of Colorado and earned his Ph.D. in physics from Duke in 1961. The news release accompanying his appointment to the STPO post notes that he had "experience in re-entry systems technology and nuclear weapons in connection with the Polaris pro-

special ... center at Maimonides Hospital in Brooklyn and professor of psychiatry at the State University of New York. With colleagues at the Maimonides ... telepathically to dreaming ... subjects. His results are statistically significant, although they do not yet appear to have been definitely corroborated by other investigators. Last year ... Health ... coordination of this study.

The NIMH seems to have given only one previous grant for psychical research, an award made in 1971 to Peter Phillips, a theoretical physicist at

## Briefing

gram" and was involved over a period of years with the civilian space program.

Stever is quoted as saying, "I am especially ... this means that ... will now move forward rapidly to help advance national goals in science and technology through these new functions assigned by the President. Dr. Drew's expertise and experience will be most helpful in this regard."

At this point the new office has a nucleus of three OST alumni as staff members, and other appointments are expected in the near future. The NSF policy unit, however, is to be considerably smaller in size than was OST when the ax fell. Last December OST had a total staff of about 60 people, half of them professionals.

Already on board and expected to continue to be active in the general areas they tended at OST are F. Gilman Blake, who dealt with natural resources problems, particularly with mineral resources; Edward J. Burger, Jr., a physician and biological scientist who specialized in health and environmental issues; and Hyrum D. Lyon, Jr., who was at OST on loan from the Defense Department. At OST Lyon handled aerospace matters and was increasingly concerned with advanced technology. Lyon has also been serving as a special assistant to Stever on administrative issues pertaining to the new office. Because of a squeeze on office space at NSF headquarters, the STPO will, for the time being, occupy offices in the same Executive Office Building near the White House in which OST has been situated.

The pattern at OST over the years has been of a staff composed of a small core of career government types with a larger number of specialists in various areas recruited from government agencies, universities, and industry who stayed for periods of a year to several years. The dean of the OST staff, David Z. Beckler, whose service in the White House science advisory apparatus antedated the creation of OST a decade ago, has retired from federal service. Frank R. Pagnotta, who was OST's administrative officer for 7 years, moved to the Central Intelligence Agency as an executive assistant in the office of the director, James R. Schlesinger.

The OST staff member most directly involved in biomedical research questions, Leonard Laster, has retired from federal service to become executive director of the National Academy of Sciences' new Assembly of Life Sciences.

The job market value of OST experience seems to have held up and, in addition to a few OST people who returned to their own businesses or set up shop on their own, "everybody got good jobs," says Pagnotta. This apparently also applies to OST secretaries, most of whom will be working in other federal agencies.

Everyone connected to the new NSF policy office stresses that a lot of details remain to be worked out. On such issues as what use will be made of outside advisers to replace the President's Science Advisory Committee, as one official put it, "there's still a lot of thinking to do."—J.W.

## Restored HEW Funds May Be Buried by Regulation

Congress is trying valiantly to restore funds for some of the health programs that President Nixon wants to eliminate, either because they are not working or because, as demonstration projects, they have proved their worth and should be taken over by local or state governments. In a move to thwart the Administration's intent to abolish the regional medical programs, the family planning and population research program, the Hill-Burton program for hospital construction, community health center programs, and others, the House and Senate have passed legislation that would extend these activities for 1 year.

Subsequently, Nixon obligingly signed the bill into law, even though the $2.2 billion it would give the Department of Health, Education, and Welfare (HEW) for these activities was almost twice the amount the Administration had said it was willing to spend. In signing the law, Nixon issued a statement saying, "While the authorization levels are higher than I believe desirable, they will not damage our overall fiscal position if the Congress now follows my budget recommendations in the appropriations process."

Another reason that these authorizations will not damage "our overall fiscal position" is that much of the money will probably never be spent. Congress tries, but apparently the Administration tries harder. It promulgated a regulation in the 21 May *Federal Register* that has received little attention but that could do much to keep the money Congress wants spent on these social programs right in the federal treasury. The HEW regulation requires that, in order to qualify to receive funds, "health services delivery projects" must show that they can become financially self-sufficient, community-based operations.

Unhappy with this turn of events, Representative Paul G. Rogers (D–Fla.) points out that, because these programs are for the poor, it is unreasonable to assume that they might become self-sufficient. He maintains that the regulation will "doom all migrant health programs, all neighborhood health centers, all family health centers, and about half of the community mental health centers." Rogers has written to HEW Secretary Caspar Weinberger suggesting that the department's action may be illegal unless it can show that Congress, in passing the legislation in the first place, intended that potential economic self-sufficiency be a criterion for funding the programs. He has not yet received a reply.—B.J.C.

the Washington University St. Louis. Phillips, who works part time on psychical research, used the NIMH grant in work with an ESP teaching machine, but got null results which he did not publish. He is now investigating a phenomenon known as psychic photography (an apparent ability to influence photographic film by the power of the mind). By borrowing a mailing list from a man who runs a witchcraft school, Phillips has been able to locate six individuals who claim or appear to be able to imprint mental impressions on film.

Another group of physicists interested in psychic phenomena are Russell Targ and Harold Puthoff of the Stanford Research Institute. Both worked in plasma and laser physics before becoming interested in psychic phenomena. Like many of the younger school of parapsychologists, they are uninterested in amassing more statistical evidence for ESP—they believe that is [illegible] and enough—and wish to learn more about the process itself. At present they are studying an Israeli "sensitive" and his ability to influence mentally such physical instruments as a magnetometer.

Not all parapsychology is done by parapsychologists. The Hodgson fund at Harvard, for example, endowed for research on psychic phenomena, has been used periodically by members of the Harvard faculty to investigate matters such as water divining and ESP. Before going to Delmore, the fund was most recently employed by an undergraduate physics major to construct a long-period, ultrasensitve pendulum, which he attempted to move by psychokinesis. He would look at the pendulum through a window, mentally pushing it one way for 30 seconds and then the other, for an hour at a time. For weeks the pendulum showed not a shadow of movement before giving what appeared to be the first positive results. "Ten days later," says Edwin B. Newman, a member of the Harvard psychology faculty, "the student graduated and went off to theological school and we never saw him again." Like other academic psychologists, Newman is skeptical of the parapsychologists' findings but is nevertheless sufficiently interested in the possibilities to have supervised an experiment in ESP (the results of which was a "perfect textbook demonstration of the laws of chance"). The history of the field, he believes, is characterized by the elusive nature of the evidence: "Every time we get our hands on something, it slips through our fingers like quicksilver."

If academic psychologists used to be atheists in the matter of ESP, there are signs that more are taking an agnostic view. But it is more their hostility than their skepticism that has diminished. Although the parapsychologists have now amassed an impressive volume of apparently careful experimental literature—chiefly in the *Journal of Parapsychology* and the *Journal of the ASPR*—critics charge that the published work represents an artifact, in as far as it tends to be only the successful experiments that get reported, while the presumably more numerous null results go unremarked. Parapsychologists also suffer from the disadvantage of being enthusiasts; they are not neutral scientific observers in the sense that they are already persuaded that ESP exists.

Parapsychologists are still unable to satisfy the demand for a repeatable experiment. Their answer is that ESP is an intermittent and uncertain phenomenon that, by its very nature, cannot be produced on demand. "You have to prepare yourself for work in this field," admonishes Rhine. "You can't expect results like setting out a rain gauge." This being the case, the road to belief in ESP is arduous. Helmut Schmidt of the FRNM, for example, says it would take 2 months in his laboratory for him to convince someone of the existence of ESP.

The fact that psychologists are somewhat more prepared to give the parapsychologists a hearing says much about the ever-delicate relationship between the two communities. By and large, psychologists do not read the parapsychological literature, and their impressions are mostly derived from the mass media. (One of the more common complaints of psychical researchers is that mainstream scientific journals—*Science* included—will either not give them space or demand unreasonably high standards of proof.) Osis, research director of the ASPR, finds it "distressing that the changed attitude of the scientific community seems to be more related to change in popular interests than to reading our research reports."

But one way or another, the parapsychologists are breaking some ground. "The parapsychology group has not faded away, and I think they are slowly gaining [illegible] spectability

## Radio Telescope Funds at Issue

The House Appropriations Committee created distress in the astronomy community last month when it voted to eliminate $10 million that the Administration had requested to begin construction of the Very Large Array (VLA) telescope in fiscal 1974. The Senate Appropriations Committee, however, has recommended that construction begin. So the immediate prospects of the new radio telescope will not be known until a House-Senate conference resolves the difference.

A House staff member said that the House has no intention of killing the $78 million project. The committee report explains that "in view of general budget constraints and with earthbound National Science Foundation priorities the VLA can be deferred at this time."

[illegible] desert site in [illegible] concerned about the [illegible] the planning stages for [illegible] there have been three major studies since 1964 on [illegible] needs. The most recent, a National Academy of Sciences study headed by Jesse Greenstein of the California Institute of Technology, has construction of the VLA as the top priority. This emphasis reflects the unusual unanimity in the field on the need for the new telescope, which "can break through existing observational barriers on a broad front and reveal important new lines of enquiry."

Money for the VLA constitutes the largest new equipment item in the 1974 NSF budget. The Administration requested $579 million in new appropriations for NSF in 1974; the Senate committee settled on $571.6 million, the House committee on $10 million less.—C.H.

Julian Lasky, executive secretary for the last 9 years of the NIMH study section that awarded Ullman his research grant. "They are perfectly well trained, respectable scientific investigators. They are sincere and serious and they deserve a chance." (Asked if there had been much debate in the NIMH council about the Ullman grant, Lasky says there had not, because the council had other, more controversial matters to deal with.)

Surveys among the scientific community hint at some of the complexity in the change of attitude toward psychic phenomena. Polls conducted among members of the American Psychological Association in 1938 and 1952 indicated that the attitude toward the study of ESP had become significantly more favorable between the two dates. The same questionnaire was recently sent out to its readers by *New Scientist*, an English scientific magazine. The returns—from 1500 readers, most of them scientists, and 29 percent with higher degrees—showed that a quarter of the respondents believed ESP to be an established fact and another 42 percent considered it a likely possibility. Not so heartening for parapsychologists is that less than a third of the sample thought that they were tackling their problem in the right way. More than half considered that parapsychology was making "little if any progress"; as against which only 4 percent view it as a "pseudoscience" (*New Scientist*, 25 January 1973).

Although some progress is being [illegible] parapsychologists still face the same set of internal problems. Maybe because of the lack of any unifying theory about psychic phenomena, there seems to be little debate or even doctrinal differences between the various centers. "You hesitate to say someone's ideas are nonsense in this field," remarks one psychical researcher. Another problem is money. There are numerous rich widows prepared to support attempts to put them in touch with their late husbands, but parapsychologists cannot risk their credibility with the scientific community by accepting this kind of money. In fact, they would have had trouble keeping their heads above water were it not for the success of the Xerox Corporation. Chester F. Carlson, the inventor of xerography, left some 2 percent of his estate for psychical research. The FRNM, the ASPR, and the University of Virginia are said to have received about $1 million each from the Carlson bequest.

Another important patron is the Chicago publisher and Nixon crony W. Clement Stone, who has settled some $200,000 on the FRNM and at one time was a regular visitor at the foundation's meetings. A less well-known benefactor of psychical research is James Kidd, an Arizona gold miner who disappeared from the world without a trace in 1946 but left a will (discovered 18 years later) which revealed an estate of $270,000 and instructions that the sum be spent on "research or some scientific proof of a soul of the human body which leaves [illegible] received more than 100 claims but awarded the legacy to a local neurological institute. The decision was contested by the ASPR, which won its case last year after 6 years of litigation. The Kidd legacy was not only a windfall but proved the parapsychologists could at least convince a court of the seriousness of their intentions. And dead donors, be it said, do not give the same trouble as the living. One parapsychologist who has relied on private patrons for support describes his experience as "rather like working with Renaissance Popes—the level of intelligence and corruption is about the same."

"Among the scientific professions of the Western world," Rhine remarked in a lecture given in London in 1965, "there has grown up a conviction that the universe is physical, and that anything that does not fit the physical picture is unreal and should be ignored if it cannot be disproved. . . . The natural result is a silent boycott of any unassimilable claim that arises, and this is the real opposition parapsychology has now to encounter." Even a profession, however, can change its mind, sometimes overnight—as witnessed by the medical profession's sudden acceptance of acupuncture. The climate is probably now more favorable than ever for parapsychologists to break the boycott and secure a fairer hearing for their claims. But there is probably some little way yet to go before parapsychology becomes assimilable into the realm of natural science.—NICHOLAS WADE

# Pesticides: Environmentalists Seek New Victory in a Frustrating War

The effort by environmentalists to eliminate the use of the chlorinated hydrocarbon pesticides seems to have settled into a long war of attrition in which clear-cut victories are few and the frustrations many. The clearest victory to date was the nearly total ban last year by the administrator of the Environmental Protection Agency (EPA) against use of DDT. Yet, although DDT has been the most widely and heavily used of the chlorinated hydrocarbons, several others remaining on the market all share, in varying degree, the same characteristics regarded as undesirable and dangerous in DDT—persistence and mobility in the environment, a tendency toward "biomagnification" at higher levels of the food chain, and a broad, nonspecific biocidal effect. The persistent pesticides still available for various specified uses include mirex, chlordane and heptachlor, and aldrin and dieldrin, these last two deemed by some to be an especially serious threat because of their high toxicity and pronounced tumorigenic effect on test animals.

A current priority of the Environmental Defense Fund (EDF), the environmental law group that has led the fight against persistent pesticides, is to bring about a ban of aldrin and dieldrin, which must be thought of together because aldrin converts to dieldrin in